Commonwealth of Kentucky
Division for Air Quality

PERMIT STATEMENT OF BASIS

TITLE V/SYNTHETIC MINOR DRAFT PERMIT NO. V-03-028
G.E. LIGHTING, LLC
116 W UNIVERSITY DRIVE, SOMERSET, KY.
AUGUST 11, 2003
RALPH E. GOSNEY, REVIEWER
PLANT I.D. # 021-199-00021
APPLICATION LOG # F389/50200

SOURCE DESCRIPTION:
The application from G.E. Lighting, LLC, received on November 20, 1997, was called complete on January 19, 1998. The facility processes borosilicate pressed glass used in the manufacture of sealed beams, blown glass, and glassware manufactured from raw material. Emission units include units for receiving and storage, batch handling and mixing, melting and refining, reflector forming, annealing, and finishing. The process involves the (1) generation of particulate matter during materials handling operations, (2) combustion products and by products from burning of fossil fuel in furnaces and boilers, (3) fugitive dust from paved and unpaved areas, and (4) volatilization of compounds contained in formulations used in the process operations. Bulk ceramic raw materials received are melted with cullet (scrap glass) at high temperatures into refined molten glass. Temperatures of the glass are lowered so that it can be handled in the forming operation. The manufactured glass passes from the melter/refiner to the forming equipment via forehearths, relatively shallow refractory channels with means to control the glass temperature. Glass is removed and cut into "Gobs" which are then pressed into the desired shapes. There are two small natural gas boilers, which are used to supply space heat.

The facility is classified as a major source of air pollution based on the potential to emit more than 100 tons per year (tpy) of nitrogen oxides (NO_x) and sulfur dioxide (SO_2), the potential to emit more than 25 tpy of combined hazardous air pollutants (HAPs), and the potential to emit more than 10 tpy of a single HAP. National Emission Standards for Hazardous Air Pollutants (NESHAP) – 40 CFR 63, Subpart N applies to the hard chromium-electroplating unit. New Source Performance Standards (NSPS) – 40CFR 60, Subpart CC applies to the 915 SF Melter/Refiner, last modified in 1993.

The following is a list of significant emission units.

E. Unit 1000 and 2000	Indirect Heat Exchangers
E. Unit 3001	Raw Material Unloading
E. Unit 3002	Bulk Material Unloading Conveyor
E. Unit 3003	Raw Material Unloading Elevator
E. Unit 4001	Boric Acid Storage Silo and Anhydrous Boric Acid Storage Bin
E. Unit 4002	Screened Sand Storage Silo
E. Unit 4003	Cullet Storage Silo

List of Significant Emission Units Continued

E. Unit 4004	Electrostatic Precipitator Catch Storage Silo
E. Unit 4005	Sodium Silica Fluoride Storage Bin
E. Unit 4006	Aluminum Hydrate Storage Bin
E. Unit 4007	5-Mol Borax Bin
E. Unit 4008	Unscreened Sand Storage Silo
E. Unit 5001	125-lb Raw Material Scale
E. Unit 5002	1000-lb Raw Material Scale
E. Unit 5003	3000-lb Raw Material Scale
E. Unit 6000	Furnace Raw Materials Mixer
E. Unit 7000	Mixed Batch Bin
E. Unit 8001	Furnace Batch Scale
E. Unit 8002	Furnace Cullet Scale
E. Unit 9001	Furnace Batch Screw Feeder
E. Unit 9002	Furnace Cullet Vibrating Conveyor
E. Unit 9003	Furnace Pocket Feed Conveyor
E. Unit 10000	Furnace Cullet Elevator
E. Unit 12000	915 SF Melter/Refiner
E. Unit 18000	100 SF #2 Furnace Melter/Refiner
E. Unit 22000	Hard Chromium Electroplating
E. Unit 23000	Glass Cleaning

COMMENTS:

E. Unit 1000 and 2000 Indirect Heat Exchangers

401 KAR 61:015 applies to the existing natural gas fired indirect heat exchanger units, which are less than 250 mmBtu per hour and constructed before April 9, 1972. The combined particulate emissions from emission units 1000 and 2000 shall not exceed 0.63 lb/mmBtu based on a three-hour average. Neither boiler stack shall have emissions equal to or greater than forty (40) percent opacity. The combined sulfur dioxide emissions from emission units 1000 and 2000 shall not exceed 3.55 lb/mmBtu based on a twenty-four-hour average.

Emissions are based on the maximum heat capacity rating of the units and AP-42, Chapter 1.4 Natural Gas Fired Combustion emission factors. These units are considered to be in compliance with the allowable PM, opacity, and SO_2, limitations while burning natural gas.

E. Unit 3001 - 10000 Miscellaneous Emission Units Constructed or Modified after 1975, Subject to 401 KAR 59:010, Listed in State Operating Permit O-88-072

The raw materials (boric acid, sand, sodium silica fluoride, and aluminum hydrate) are received by railcar and unloaded into an underground hopper. Emission of particulate from the unloading is uncontrolled. Emission from the storage bins and an enclosed elevator are controlled by cloth filters, which are placed over the vents of each bin.

Once the raw materials are loaded into storage bins, they are processed for each of the two furnaces in the same way. The raw materials are pneumatically conveyed to the scales, then fed to the mixers. The mixed batches are then conveyed to the mixed batch bin (feeding the feed scales) which have emissions of particulate matter controlled by filters. The weighed mixed batch is conveyed to the feed hoppers, which feed the furnace on a continuous basis. Filters control particulate emissions from the feed scales, conveyer, and feed hopper.

401 KAR 59:010, Section 3(2) and Operating Permit O-88-072 sets particulate emission limitation on a lb/hr basis. In addition, the State Operating Permit O-88-072 sets particulate emission limitation on a ton/yr basis. Per 401 KAR 59:010, visible emissions shall not equal or exceed 20% opacity.

Particulate emissions are based on the monthly operating rate (tons/month) x the emission factor (lb PM/ton) / Hours of operation per month (hr/month) x [1 – control device efficiency]. The permittee emission factors from each unit or transfer point were derived from factors presented in U.S. EPA's Source Assessment: Pressed and Blown Glass Manufacturing Plants (EPA-600/2-77-005), rated B for reliability.

E. Unit 3001 - 10000 Miscellaneous Emission Units Constructed or Modified after 1975, Subject to 401 KAR 59:010, Listed in State Operating Permit O-88-072 (Continued)

The hourly processing and annual processing rates for the total throughput for emission units 3001, 3002, and 3003 and hourly and annual PM emission limitations are set in accordance with the Operating Permit O-88-072. At an emission factor of 1 lb PM/ton processing rate, that was referenced in the application from U.S. EPA's Source Assessment: Pressed and Blown Glass Manufacturing Plants (EPA-600/2-77-005), the source would be out of compliance with the emission limitations set in Operating Permit O-88-072, if the processing rate limits of 50 tons/hr and 29,000 tons/yr were followed. Therefore, the processing rate is limited to 32.4 tons processed per hour and 18,120 tons processed per year in the Title V permit.

E. Unit 12000 915 SF Melter/Refiner

Borosilicate glass is processed by the 915 SF melter/refiner. The raw materials are reacted together until molten glass is free of bubbles and inclusions. The furnace has two refractory chambers of checkerworks for preheating and heating of combustion gases. The heated gas flow is reversed between 10 and 30 minutes intervals, so that combustion air is drawn through previously heated chamber by flue gases. An electrostatic precipitator controls emissions from the furnace. The furnace also has a by-pass stack for use when the control equipment is down for maintenance.

40 CFR 60, Subpart CC – Standards of Performance for Glass Manufacturing Plants apply to the melter/refiner. The PM emission shall not exceed 0.5 grams of particulate/kg of glass produced. For compliance with the PM emission limit, an emission factor of 0.394 lbs PM/ton of raw material processed through the unit shall be used, based on the highest value from the 1993, 1995, and 1996 stack tests, until new information is gathered from the unit stack test that shall be performed within 6 months from issue of this permit. Emission factors derived from stack testing are to replace the emission factor currently listed in the permit, and shall be used to calculate future emissions.

Pursuant to 401 KAR 53:010, no person shall, directly or indirectly, emit into or discharge into the air, or cause, permit, or allow to be emitted or discharged into such air contaminants that shall cause or contribute to the pollution of the air of the Commonwealth in contravention of the emission standards or the ambient air standards (refer to primary and secondary ambient air quality standards in Appendix A to 401 KAR 53:010).

E. Unit 18000 100 SF #2 Furnace Melter/Refiner

The 100 SF melter is identical in operation to the 915 SF melter, except that it is smaller and does not have electrical boosters. The molten glass flows through a trough (called forehearths), and is kept heated by natural gas direct heating. There are no controls for particulate matter emissions from this unit.

As requested by the applicant, the glass pull rate shall not exceed 0.17 tons/hr, to preclude the applicability of Prevention of Significant Deterioration of Air Quality, 401 KAR 51:017. In accordance with State Operating Permit O-88-072, the combined total processing rate of raw materials used in emission unit 18000 shall not exceed 1,118.21 tons/year. 401 KAR 61:020, Section

3 and Operating Permit O-88-072, apply a particulate emission limitation on a lb/hr rate. State Operating Permit O-88-072, applies a particulate emission limitation on a ton/yr rate.

Pursuant to 401 KAR 61:020, Section 3(1), continuous emissions into the open air from the melter/refiner shall not be equal to or greater than forty (40) percent opacity.

To demonstrate compliance with the lb/hr particulate emission rate limitation, the rate will equal the monthly operating rate (tons/month) x Emission factor (lb PM/ton) / Hours of operation per month (hr/month) x [1 – control device efficiency].

E. Unit 22000 Hard Chromium Electroplating

The hard chromium-electroplating tank was constructed or modified after 1975. The unit was tested in 1996 for compliance with NESHAP. The volumetric flow rate of the hood over the plating tank was determined to be 4,008 dscm/hr. The unit is rated at 1000 amp-hr/hr, and is controlled by a packed bed scrubber/composite mesh pad system.

40 CFR 63, Subpart N sets the national emission standards for chromium emissions from hard and decorative chromium electroplating and chromium anodizing tanks. 401 KAR 59:010 applies to the new process operations.

40 CFR 63.342(f) defines the work practice standards for the unit. Total chromium emissions shall not equal or exceed 0.03 mg/dscm or 1.3E-05 gr/dscf [40CFR63.342(c)(1)(ii)]. Pursuant to 401 KAR 59:010, Section 3(2) and in accordance with the Operating Permit O-88-072, particulate emissions shall not exceed 2.34 lb/hr. Pursuant to State Operating Permit O-88-072, particulate emission shall not exceed 2.68 tons per year. Pursuant to 401 KAR 59:010, continuous emissions into the open air from the tank's stack shall not be equal to or greater than twenty (20) percent opacity.

From test data on the unit in 1996, it was assumed that all the particulate matter emitted from the unit was total chromium. For compliance with the PM and total chromium emission limit, an emission factor of 0.0395 mg/amp-hr shall be used for each, based on the average of three test runs performed on 12/6/96, until new information is gathered from the compliance test that shall be performed within one year from issue of this permit. Emission factors derived from compliance testing are to replace the emission factor currently listed in the permit, and shall be used to calculate future emissions.

E. Unit 23000 Glass Cleaning

The glass cleaning operation consists of seven 42-gallon washing tanks, two soap mixing tanks, four holding reservoirs, and one reverse-osmosis de-ionized water purification system. The maximum production rate is 1 gallon oxide remover (0.01 % ammonia)/hr and 1 gallon ethanolamine solution (10 % ethanolamine)/hr. The unit was constructed after 1975, and there are no controls for emissions.

In accordance with the Construction Permit C-92-008, the ethanolamine feed rate shall not exceed 0.8905 lb/hr. Based on the results a screening model for ethanolamine emissions and the maximum production rates indicated in the application, the permittee received Construction Permit C-92-008. The source will be in compliance, as long as the operating limitation or the feed rate is not exceeded.

EMISSION AND OPERATING CAPS DESCRIPTION:
Source wide emission of ethanolaminine shall not exceed 1.98 lb/hr.
Hydrogen chloride emission from the source shall not exceed 8.40 lb/hr and 36.8 tons/yr.
Antimony trioxide emission from the source shall not exceed 0.598 and 2.62 tons/yr.
Titanium dioxide emission from the source shall not exceed 5.98 lb/hr and 26.2 tons/yr.

OPERATIONAL FLEXIBILITY:
None

CREDIBLE EVIDENCE:

This permit contains provisions, which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

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